

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

5 Claims 1-22 (canceled)

1 23. (Currently Amended) An integrated circuit structure formed at the surface of
2 a substrate, comprising:

3 a plurality of shallow trenches formed in the surface of the substrate;

4 a nitrogen doped insulating liner grown on sidewalls of the shallow trenches
5 by treating said sidewalls with an oxygen rich atmosphere followed with
6 treating said sidewalls with a nitrogen compound;

7 a gap filling insulating material filling the shallow trenches level with the
8 surface of the substrate ~~said gap filling insulating material being high~~
9 temperature annealed to cause ~~said gap filling insulating material to~~
10 become more dense; and

11 a plurality transistors formed in the surface of the substrate in regions
12 between said shallow trenches, wherein each of said transistors include
13 a source and a drain formed by diffusing an impurity species into the

14 surface of said substrate, wherein said nitrogen doped insulating liner
15 acts as a stop to prevent said impurity species from diffusing into said
16 substrate from said gap filling insulating material.

1 24. (Previously Presented) The integrated circuit structure of claim 23 wherein
2 said nitrogen compound is selected from the group of nitrogen compounds
3 consisting of nitrogen (N_2) gas, ammonia (NH_3), nitric oxide (NO), and
4 nitrous oxide (N_2O).

1 25. (Previously Presented) The integrated circuit structure of claim 23 wherein
2 the oxygen rich atmosphere is selected from the atmospheres consisting of
3 steam and oxygen gas.

1 26. (Previously Presented) The integrated circuit structure of claim 23 wherein
2 the treating of the sidewalls of the shallow trenches with the oxygen rich
3 atmosphere of the shallow trenches is at a temperature from
4 approximately 900° C to approximately 1000° C, at a pressure of from
5 approximately 600 Torr to approximately 760 Torr, for a period of time
6 from 60 minutes to 120 minutes.

1 27. (Previously Presented) The integrated circuit structure of claim 26 wherein
2 the treating the internal surfaces of the shallow trenches with the nitrogen
3 compounds is at a temperature of from approximately 900 °C to
4 approximately 1000 °C at a pressure of from approximately 600 Torr to

5 approximately 760 Torr for a period of time of from approximately 30
6 minutes to approximately 90 minutes.

1 28. (Previously Presented) The integrated circuit structure of claim 24 wherein
2 the nitrogen doped insulating liner is formed by exposing the sidewalls of
3 said shallow trenches to a nitrogen rich and oxygen rich atmosphere
4 thermally to grow a silicon oxynitride layer on said sidewalls

1 29. (Previously Presented) The integrated circuit structure of claim 28 wherein
2 the nitrogen rich and oxygen rich atmosphere is at a temperature of from
3 approximately 900 °C to approximately 1000 °C, and at a pressure of from
4 approximately 600 Torr to approximately 760 Torr for a period of from
5 approximately 120 minutes to approximately 180 minutes

1 30. (Previously Presented) The integrated circuit structure of claim 28 wherein
2 the nitrogen rich and oxygen rich atmosphere includes nitrogen
3 compounds selected from the set of nitrogen compounds consisting of
4 nitrogen (N₂) gas, ammonia (NH₃), nitric oxide (NO), and nitrous oxide
5 (N₂O) and oxygen rich compounds selected from the set of oxygen rich
6 compounds consisting of steam (H₂O) and oxygen (O₂)

1 31. (Previously Presented) The integrated circuit structure of claim 23 wherein

2 the nitrogen doped insulating liner has a thickness of from approximately

3 10 nanometers to approximately 30 nanometers.

- 1 32. (Previously Presented) The integrated circuit structure of claim 23 wherein
- 2 the gap fill insulating material is selected from insulating materials
- 3 consisting of CVD formed silicon oxide and spun-on-glass silicon dioxide.

- 1 33. (Previously Presented) The integrated circuit structure of claim 23 wherein
- 2 the impurity species is boron.

- 1 34. (New) The integrated circuit structure of claim 23 wherein said gap filling
- 2 insulating material is high temperature annealed to cause said gap filling
- 3 insulating material to become more dense.